



Figure 1. Sonograms of songs of Dulit Frogmouth *Batrachostomus harterti* and Large Frogmouth *B. auritus*. The song of Dulit (recorded by BK at an undisclosed site in the Kelabit Uplands, Sarawak, 4 September 2004) is a loud trumpeting monotone, *whoooooooooaaah*, quite distinct from the rapid, sonorous, hollow tremolo, *whowhohowhohowhohowhohowhoooo*, of Large, which is reminiscent of some *Strix* spp. owls (example here recorded by BK at 60 m c.1 km from headquarters of Gunung Mulu National Park, Sarawak, on 31 March 1978).

as well as good views at about 15 m with 10× binoculars. The following morning we obtained more recordings.

Altogether we tape-recorded eight song-bouts consisting of 1–8 notes each, as well as several other calls uttered in response to song playback. The spacing between songs in a bout was 0.98–2.7 seconds, with most spaces in the lower end of this range, and the few longer spaces at the end of a bout. We heard two birds close at hand, which we presume were a pair, one of which we saw. A third bird was heard in the distance.

The frogmouth was identified by a combination of size, voice, altitude and locality. First, the large size eliminated all the known Asian frogmouths except Dulit and Large *B. auritus*. Second, the two of us have heard a total of around 25 individuals of Large Frogmouth in Borneo, Sumatra and Peninsular Malaysia, and have never heard a vocalisation like this one; further, the birds uttered the vocalisation without apparent provocation, suggesting that it was the song and thus comparable to the known song of Large Frogmouth. Third, the known altitudinal range of Dulit Frogmouth is 300–1,200 m (Smythies & Davison 1999), while Large Frogmouth has been found only in lowland forests in Borneo ('lowlands ... below the

steep land boundary': Smythies & Davison 1999), and it is also known only from lowland forests in Sumatra (van Marle & Voous 1988, MacKinnon & Phillipps 1993) and the Malay Peninsula (Wells 1999). Fourth, the Dulit Frogmouth has been collected in the Kelabit Uplands while the Large Frogmouth has not. All this does not prove beyond every doubt that the bird we tape-recorded and observed was a Dulit Frogmouth, but the evidence is highly indicative. A voucher specimen of a tape-recorded individual is, however, desirable.

Smythies (1960) pictured both Dulit and Large Frogmouths and some differences in the two birds can be seen in the paintings. However, BK looked at specimens of the latter and found that extensive plumage variation covered all the differences (and more) seen in the Smythies plates. AMNH has no specimens of Dulit Frogmouth. It may be that vocalisations and perhaps altitude will turn out to be the only way to distinguish these two species in the field.

ACKNOWLEDGEMENT

We wish to thank Jeff Groth for preparing the sonogram.

REFERENCES

- MacKinnon, J. & Phillipps, K. (1993) *A field guide to the birds of Borneo, Sumatra, Java, and Bali: the Greater Sunda Islands*. Oxford: Oxford University Press.
- van Marle, J. G. & Voous, K. H. (1988) *The birds of Sumatra*. Tring: British Ornithologists' Union.
- Marshall, J. T. (1978) Systematics of smaller Asian nightbirds based on voice. *Orn. Monogr.* 25 (American Ornithologists' Union).
- Smythies, B. E. (1960) *The birds of Borneo*. Edinburgh and London: Oliver & Boyd.
- Smythies, B. E. & Davison, G. W. H. (1999) *The birds of Borneo*. Kota Kinabalu: Natural History Publications (Borneo).
- Wells, D. R. (1999) *The birds of the Thai-Malay Peninsula*. Volume 1: Non-passerines. San Diego: Academic Press.

Ben King, Ornithology Dept., American Museum of Natural History, Central Park West at 79th St., New York, NY 10024, USA

Dennis Yong, Kingfisher Tours Sdn. Bhd., Suite 1107, 11th Fl., Bangunan Yayasan Selangor, Jalan Bukit Bintang, 55100 Kuala Lumpur, Malaysia

Notes on the roost sites of the Sulawesi Masked Owl *Tyto rosenbergii*

JAMES A. FITZSIMONS

The ecology of most of Sulawesi's owl species is poorly known (Bishop 1989, Holmes & Phillipps 1996, Bruce 1999, Marks *et al.* 1999, Debus 2002, 2009, König & Weick 2008). The recent discovery of new species (Rasmussen 1999, Indrawan & Somadikarta 2004),

limited distributional details on rare or cryptic species (e.g. Mauro & Drijvers 2000) and only recent publication of basic ecological information on widespread and common species highlight this point. This note provides some details on the roosting (and potential breeding)

ecology of the Sulawesi Masked Owl *Tyto rosenbergii*. The Sulawesi Masked Owl is endemic to Sulawesi where it is widespread but uncommon (Coates & Bishop 1997). It occurs in a range of habitats from lightly wooded cultivation, tall dead trees in open country, grassland, rainforest, forest edge and coconut plantations, and occasionally around villages and urban areas (Coates & Bishop 1997, König & Weick 2008).

Roosting and breeding sites for a few *Tyto* species worldwide are well known, such as the Barn Owl complex (formerly *Tyto alba*) (Bruce 1999). However, Bruce (1999: 51) suggested that nothing is known of this aspect of the ecology of species within the masked owls (other than the Australian Masked Owl *Tyto novaehollandiae*), although he also notes that 'it seems likely that all members of this closely related group will have similar habits [to the Australian Masked Owl]'. Holmes & Phillipps (1996: 35) suggest the Sulawesi Masked Owl 'probably roosts by day in large trees...'. Both Bruce (1999) and König & Weick (2008) state that no breeding details for this species are described. Thus König & Weick (2008) suggested that the Sulawesi Masked Owl needs intensive study as nearly all aspects of its life are unknown. Here I provide some details of roost and breeding sites based on personal observations of the Sulawesi Masked Owls, discussions with park rangers and guides and reviewing published literature and unpublished birdwatching trip reports.

On 14 July 2009, as part of a guided birdwatching tour of Tangkoko-Duasudara Nature Reserve and surrounds, in north-east Sulawesi, I was taken by boat to view a known roost site of a Sulawesi Masked Owl. The site was a sea cave located north-east of the village of Batu Putih (1°35'11"N 125°09'28"E) on the tip of a short peninsula facing east. A single bird was present, awake and at times preening and viewed for 10 minutes. The cave itself was c.10 m above sea level with an opening c.3×5 m. The owl was partially sheltering behind a boulder but not far (<1 m) from the cave entrance. Many pellets, bones and excreta were evident both on the cave floor and spilling onto ledges below, indicating significant use of this roost site. Indeed the species is known to have occupied this cave from at least April 2006 and has been documented as present in all years since (see Table 1). In seven of these observations a pair of owls was observed using the cave, potentially indicating breeding. However, three trip reports have indicated the bird(s) were not always present or at least not on view when the site was visited. Elsewhere, Bruce (1999) also described food items from regurgitated pellets, presumed to be from Sulawesi Masked Owl, collected from a cave in Sulawesi (location not described).

On 18 July 2009 at the park headquarters of Bogani Nani Wartabone National Park at Toraut (0°34'N 123°54'E), I was shown the site of a recent Sulawesi Masked Owl roost by guide Idjong Datunsolang. It was a large tree located on the edge of the rainforest behind the park headquarters. Although the bird could not be located during the day it was heard at night.

Previously published papers and unpublished trip reports outline use of a variety of different tree structures for roosting and potentially breeding. Most documented observations are from Toraut. Rozendaal & Dekker (1989) found a pair to frequent tall dead trees in open country in the Toraut base camp area in March 1985. Luijendijk (1997) found '3 at a nest' opposite the park headquarters in September 1997, but provided no further details.

Ahlman (1999) provided a map indicating the location of a tall tree where Sulawesi Masked Owls were nesting (to the front of the headquarters on the river side). Maher & Gregory (2000) and Hoff (2000) found a Sulawesi Masked Owl perched in a tree near the Toraut lodge.

Interestingly, Fletcher (1998) described an instance of breeding by what he considered to be Minahassa Masked Owl *T. inexpectata* in Bogani Nani Wartabone National Park at Toraut. He observed two adults and a juvenile c.25 m up a strangler fig, roosting and presumably nesting within. Mauro & Drijvers (2000) queried Fletcher's (1998) identification and suggested his observations were of a Sulawesi Masked Owl; in the only other documented breeding of Minahassa Masked Owl, Coates & Bishop (1997) cited van Marle (1940) apparently finding a pair nesting in a hole of a *Elmerilla ovalis* tree. Andrew & Bishop (1990) reported a Minahassa Masked Owl being flushed from a roost in 'disturbed riverine forest with patches of bamboo', also at Bogani Nani Wartabone National Park. Mauro & Drijvers (2000) also suggested this record be considered tentative as it could refer to Sulawesi Masked Owl. Away from Bogani Nani Wartabone National Park, Ericsson & de Win (2009) noted a daytime roost for Sulawesi Masked Owl was discovered in a tree hole at Tangkoko, while Coomans de Ruiter & Maurenbrecher (1948) found the species to be roosting in a coconut tree in south Sulawesi over a number of days.

Table 1. Number of Sulawesi Masked Owls present at a sea cave off Tangkoko-Duasudara Nature Reserve, north Sulawesi.

Year	Date (where specified)	No. of individuals	Source
2006	14 April	2	Gregory & Ford (2006)
2006	26 July	2	Westdean (2006)
2006	2 September	2	Lagerqvist (2006)
2006	September	2	Watson (2006)
2006	September	1	Farrow (2006a)
2006	September–October	1	Farrow (2006b)
2007	July–August	2	Hutchinson (2007)
2007	September	2	Morris & Demeulemeester (2007)
2007	September–October	1	Farrow (2007)
2008	22 August	1	Collaerts (2008)
2008	29 August	1	Pettersson (2008)
2008	September	2	Hutchinson (2008a)
2008	September	0	Hutchinson (2008b)
2008	September–October	0	Farrow (2008)
2008	1–3 November	1	Milton (2008)*
2009	14 July	1	Fitzsimons – observation described above
2009	September–October	1	Farrow & Robson (2009)
2009	11 October	0	Ericsson (2009)

*On a tree on the cliff next to the cave

On the Australian mainland, the relatively well studied Australian Masked Owl *Tyto novaehollandiae novaehollandiae* roosts in both hollow trees and caves, and less commonly in dense foliage (e.g. Debus 1993, Peake *et al.* 1993, Debus & Rose 1994, Higgins 1999), although Kavanagh (2002) found it in south-eastern Australia to roost only inside hollow trees and among dense foliage of tall subcanopy trees. Bell & Mooney (2002) found Tasmanian Masked Owls *T. n. castanops* to roost on external surfaces of trees and shrubs, with a preference for dense foliage (44% of the time), holes in cliffs (37%), buildings and man-made structures (17%) and tree hollows (3%).

The various tree hollow, cave and thick foliage roost sites used by the Sulawesi Masked Owl supports Bruce's (1999) supposition that Wallacean masked owls have similar roosting (and potentially breeding) habits to those of the Australian Masked Owl. If the latter actually nests in caves it would seem to do so only rarely (see Debus 1993, Higgins 1999). However, Higgins (1999) reports that Australian Masked Owl pairs roost together only rarely and when they do this is likely to be during courtship and nesting. Australian Masked Owls can also exhibit high nest-site fidelity (Kavanagh 1996, 2002, Kavanagh & Murray 1996, Hollands 2008), a trait potentially evident in the Sulawesi Masked Owl, as indicated by the cliff-roosting Tangkoko pair between at least 2006 and 2008. Further observations by ornithologists and birdwatchers to the Tangkoko cave site on any signs of breeding activity would be important.

The Tangkoko cave roost site contains the remains of many pellets. Although access to the site may be difficult via boat due to the nature of the cliff face, collection and analysis of this pellet material (without disturbing the roosting bird/s) could provide a better insight into the diet and broader ecology of this poorly known species.

ACKNOWLEDGEMENTS

Thanks to Idjong Datunsolang, Hendrik Rumaer and Arifin Ali of Bogani Nani Wartabone National Park, and to the guides at Tangkoko for pointing out the owls and discussing aspects of their ecology. Thanks to Stephen Debus, Nigel Collar and two anonymous reviewers for comments on a draft.

REFERENCES

- Ahlman, R. (1999) Sulawesi 3–17/7 1999. Available at: <http://www.club300.se/Files/TravelReports/sulawesi.pdf>
- Andrew, P. & Holmes, D. A. (1990) Sulawesi bird report. *Kukila* 5: 4–26.
- Bell, P. J. & Mooney, N. (2002) Distribution, habitat and abundance of Masked Owls (*Tyto novaehollandiae*) in Tasmania. Pp.125–136 in I. Newton, R. Kavanagh, J. Olsen & I. Taylor, eds. *Ecology & conservation of owls*. Collingwood: CSIRO Publishing.
- Bishop, K. D. (1989) Little known *Tyto* owls of Wallacea. *Kukila* 4: 37–43.
- Bruce, M. D. (1999) Family Tytonidae (Barn-owls). Pp.34–75 in J. del Hoyo, A. Elliott & J. Sargatal, eds. *Handbook of birds of the world, 5: barn-owls to hummingbirds*. Barcelona: Lynx Edicions.
- Coates, B. J. & Bishop, K. D. (1997) *A guide to the birds of Wallacea: Sulawesi, the Moluccas and Lesser Sunda Islands, Indonesia*. Alderley, Queensland, Australia: Dove Publications.
- Collaerts, P. (2008) Birding trip report to Sulawesi and Halmahera, August 1st–31st 2008. Available at: http://www.travellingbirder.com/tripreports/reports/indonesia_sulawesi_halmahera_birding_trip_report_aug-08.pdf
- Coomans de Ruiter, L. & Maurenbrecher, L. L. A. (1948) Stadsvogels van Makassar (Zuid-Celebes). *Ardea* 36: 163–198.
- Debus, S. (2002) Distribution, taxonomy, status, and major threatening processes of owls in the Australasian region. Pp.355–363 in I. Newton, R. Kavanagh, J. Olsen & I. Taylor, eds. *Ecology and conservation of owls*. Collingwood: CSIRO Publishing.
- Debus, S. (2009) *The owls of Australia: a field guide to Australian night birds*. Sydney: Envirobook.
- Debus, S. J. S. (1993) The mainland Masked Owl *Tyto novaehollandiae*: a review. *Aust. Bird Watcher* 15: 168–191.
- Debus, S. J. S. & Rose, A. B. (1994) The Masked Owl *Tyto novaehollandiae* in New South Wales. *Aust. Birds* 28 (Suppl.): S40–S64.
- Ericsson, P. (2009) Sulawesi, 6–13 October 2009. Available at: <http://www.pbase.com/peterericsson/sulawesi>
- Ericsson, P. & De Win, S. (2009) Sulawesi, 6–13 October 2009. Available at: <http://www.birding2asia.com/TripReports/SulawesiOct09.html>
- Farrow, D. (2006a) Sulawesi & Halmahera 5–23 September 2006. Tour Report. Available at: <http://www.shortwing.co.uk/assets/includes/printableTrip.asp?id=70>
- Farrow, D. (2006b) Sulawesi & Halmahera (2) 26 September–15 October 2006. Tour Report. Available at: <http://www.shortwing.co.uk/assets/includes/printableTrip.asp?id=71>
- Farrow, D. (2007) Sulawesi & Halmahera (2) 24 September–14 October 2007. Tour Report. Available at: [http://www.birdquest.co.uk/pdfs/report/INDONESIA%20\(SULAWESI%202\)%20REP%2007.pdf](http://www.birdquest.co.uk/pdfs/report/INDONESIA%20(SULAWESI%202)%20REP%2007.pdf)
- Farrow, D. (2008) Sulawesi & Halmahera 14 September–5 October 2008. Tour report. Available at: [http://www.birdquest.co.uk/pdfs/report/INDONESIA%20\(SULAWESI\)%20REP%2008.pdf](http://www.birdquest.co.uk/pdfs/report/INDONESIA%20(SULAWESI)%20REP%2008.pdf)
- Farrow, D. & Robson, C. (2009) Sulawesi & Halmahera 11 September–3 October 2008. Tour report. Available at: <http://www.birdquest.co.uk/pdfs/report/SULAWESI%20REP%2009.pdf>
- Fletcher, B. S. (1998) A breeding record for Minahassa Owl *Tyto inexpectata* from Dumoga-Bone National Park, Sulawesi, Indonesia. *Forktail* 14: 80–81.
- Gregory, P. & Ford, T. (2006) Halmahera April 14th–19th 2006. Available at: www.sicklebillsafaris.com/Newsletters/Halmahera2.doc
- Gregory, P. & Maher, P. (2000) Sulawesi April 25–May 13 2000. Available at: <http://www.sicklebillsafaris.com/Newsletters/SULAWESI%202000.doc>
- Higgins, P. J., ed. (1999) *Handbook of Australian, New Zealand and Antarctic birds, 4: parrots to Dollarbird*. Melbourne: Oxford University Press.
- Hoff, R. (2000) Trip Report: Sulawesi (Indonesia), April 25–May 13, 2000. Available at: <http://www.camacdonald.com/birding/tripreports/Sulawesi00.html>
- Hollands, D. (2008) *Owls, frogmouths and nightjars of Australia*. Melbourne: Bloomings Books.
- Holmes, D. & Phillipps, K. (1996) *The birds of Sulawesi*. Kuala Lumpur: Oxford University Press.
- Hutchinson, R. (2007) Sulawesi and Halmahera Custom tour 23rd July–12th August 2007. Available at: <http://www.birdtourasia.com/sulawesireport07.html>
- Hutchinson, R. (2008a) Sulawesi and Halmahera 1st–20th September 2008. Available at: <http://www.birdtourasia.com/sulawesireportsept08.html>
- Hutchinson, R. (2008b) Sulawesi and Halmahera 22nd September–11th October 2008. Available at: <http://www.birdtourasia.com/sulawesireportoct08.html>

- Indrawan, M. & Somadikarta, S. (2004) A new hawk-owl from the Togian islands, Gulf of Tomini, Central Sulawesi, Indonesia. *Bull. Brit. Orn. Club* 124: 160–171.
- Kavanagh, R. P. (1996) The breeding biology and diet of the Masked Owl *Tyto novaehollandiae* near Eden, New South Wales. *Emu* 96: 158–165.
- Kavanagh, R. P. (2002) Conservation and management of large forest owls in southeastern Australia. Pp.201–219 in I. Newton, R. Kavanagh, J. Olsen & I. Taylor, eds. *Ecology and conservation of owls*. Collingwood: CSIRO Publishing.
- Kavanagh, R. P. & Murray, M. (1996) Home range, habitat and behaviour of the Masked Owl *Tyto novaehollandiae* near Newcastle, New South Wales. *Emu* 96: 250–257.
- König, C. & Weick, F. (2008) *Owls of the world*. Second edition. London: Christopher Helm.
- Lagerqvist, M. (2006) Wallacea: Sangihe, Sulawesi and Halmahera 25/8–24/9 2006. A trip report. Available: http://www.club300.se/Files/TravelReports/Wallacea2006_ML.pdf
- Luijendijk, T. J. C. (1997) Bird observations in Sulawesi & Halmahera in July/August 1997. Available at: <http://www.warbler.phytoconsult.nl/celrap2.htm>
- van Marle, J. G. (1940) Aanteekeningen omtrent de vogels van de Minahassa (N.O.-Celebes). *Limosa* 13: 65–70, 119–124.
- Marks, J. S., Cannings R. J. & Mikkola H. (1999) Family Strigidae (typical owls). Pp.76–151 in J. del Hoyo, A. Elliott & J. Sargatal, eds. *Handbook of birds of the world, 5: barn-owls to hummingbirds*. Barcelona: Lynx Edicions.
- Mauro, I. & Drijvers, R. (2000) Minahassa Owl *Tyto inexpectata* at Lore Lindu National Park, Sulawesi, Indonesia in December 1998. *Forktail* 14: 180–182.
- Milton, D. (2008) West Papua and Sulawesi – October 2008. Available at: http://www.surfbirds.com/trip_report.php?id=1586
- Morris, P. & Demeulemeester, B. (2007) Sulawesi & Halmahera 3–23 September 2007. Tour Report. Available at: [http://www.birdquest.co.uk/pdfs/report/INDONESIA%20\(SULAWESI%201\)%20REP%2007.pdf](http://www.birdquest.co.uk/pdfs/report/INDONESIA%20(SULAWESI%201)%20REP%2007.pdf)
- Peake, P., Conole, L. E., Debus, S. J. S., McIntyre, A. & Bramwell, M. (1993) The Masked Owl *Tyto novaehollandiae* in Victoria. *Aust. Bird Watcher* 15: 124–136.
- Pettersson, G. (2008) Sulawesi & Halmahera 26 Aug–14 Sep 2008. Available at: <http://www.club300.se/Files/TravelReports/Sulawesi%20&%20Halmahera,%20aug-sep%202008.pdf>
- Rasmussen, P. C. (1999) A new species of Hawk-owl *Ninox* from north Sulawesi, Indonesia. *Wilson Bull.* 111: 457–630.
- Rozendaal, F. G. & Dekker, R. W. R. J. (1989) An annotated checklist of the birds of Dumoga-Bone National Park, North Sulawesi. *Kukila* 4: 85–109.
- Watson, M. (2006) Tangkoko – Sulawesi’s kingfisher capital. Available at: <http://mikewatsonsdairy.blogspot.com/2006/09/tangkoko-sulawesis-kingfisher-capital.html>
- Westdean, G. (2006) Sulawesi Halmahera West Papua July 23–August 22 2006. Birdwatching trip report–Indonesia. Available at: http://www.travellingbirders.com/tripreports/view_birding_tripreport.php?id=302
- White, C. M. N. & Bruce, M. D. (1986) *The birds of Wallacea (Sulawesi, the Moluccas and Lesser Sunda Islands, Indonesia): an annotated checklist*. London: British Ornithologists’ Union (B.O.U. Checklist no. 7).

James A. Fitzsimons, School of Life and Environmental Sciences, Deakin University, 221 Burwood Highway, Burwood VIC 3125, Australia, & The Nature Conservancy, Suite 3-04, 60 Leicester Street, Carlton VIC 3053, Australia. Email: james.fitzsimons@deakin.edu.au

Removal of Pink-rumped Rosefinch *Carpodacus eos* from the Thai avifaunal list

PHILIP D. ROUND, PAUL J. LEADER and SURACHIT WAENGSOOTHORN

The Pink-rumped Rosefinch *Carpodacus eos* is distributed in eastern Qinghai and western Sichuan, China, where it breeds at altitudes of c.4,000–5,000 m. It is also recorded from northern Yunnan and eastern Xizang, although there is incomplete concordance among different authors in delimiting both total range and the limits of the breeding and wintering areas (Cheng 1987, Clement *et al.* 1993, MacKinnon & Phillipps 2000, Dickinson 2003).

The species was added to the list of Thai birds by McClure (1969) on the basis of a female specimen collected at Ban Mae Kah (*sic*), Mae Taeng, Chiang Mai (CTNRC 53-1963) on 25 October 1968. The collecting location is read off the Royal Thai Survey Department 1:50,000 map sheet (Sheet no. 4747 II, Series L7017), as Ban Mae Ka, 19°08'N 98°56'E, elevation c.350 m. It lies approximately 2 km north-west of Mae Taeng district town.

The specimen is stored in the Centre for Thai National Reference Collections (CTNRC), Environment and Resources Department, Thailand Institute of Scientific and Technological Research, Bangkok. It bears the label *Carpodacus eos gery*. (The name ‘*gery*’ has no basis in the published literature and may possibly result from a transcription error from the field label—a misread transcription of ‘*C. ery*’, as an abbreviation of *C. erythrinus*, perhaps?) The measurements recorded on the label are wing 75.4; tail 58.0; culmen 5.7 and gape 6.2, although during our examination the wing measured 77 mm (maximum chord) and the tail 51.5 mm (Table 1).

This apparent Pink-rumped Rosefinch record was subsequently listed in Lekagul & Cronin (1974), King *et al.* (1975), Lekagul & Round (1991) and Robson (2000, 2002). The identification of the specimen was always